

DESCRIPTION OF THREE NEW SPECIES OF FISHES FROM JAPAN.

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PLATES XX AND XXI.

Snyderina (SCORPÆNIDÆ), gen. nov.

Body robust, compressed, sparsely covered with non-imbricate, thickened or granular scales. Head naked, ridged, without cranial spines. Profile angulated in front of eye; preorbital with a long sharp spine. Preopercle with a long sharp spine above and four smaller ones. Teeth villiform, in bands on jaws and vomer; palatines toothless. Gill-membranes narrowly united and narrowly connected with the isthmus. No slit behind fourth gill. Branchiostegals seven. Lateral line present. Dorsal continuous, with about thirteen spines and ten rays. Anal with three spines. First dorsal spine short, inserted above middle of eye; last dorsal ray adnate to caudal peduncle. Ventral rays 1, 5. Pectoral without free ray. Caudal rounded. Fins all scaleless.

This genus is named for Mr. John Otterbein Snyder, in recognition of his studies of Japanese fishes. It is allied to *Cocotropus* Kaup.

The single known species is *Snyderina yamanokami*.

Snyderina yamanokami, sp. nov.

PLATE XX.

Head 2.6 in body; depth 2.7; eye 4 in head; maxillary 2.5. Dorsal XIII, 10; anal III, 5. Pores of lateral line 21.

Body compressed, the back elevated anteriorly, deepest over posterior part of head, tapering to a rather small caudal peduncle.

Head with many spines and ridges, the ridges smooth and covered with thin skin. Profile very steep from first dorsal spine to snout, which latter projects at a sharp angle and is less nearly vertical. Mouth very oblique, the lower jaw slightly projecting. Maxillary broad at the posterior end, transversely concave. Teeth finely villiform, in bands on jaws and vomer; palatines toothless. Width of interorbital space about two-thirds diameter of eye. Two nearly parallel high sharp ridges run from first dorsal spine to

snout. A ridge around anterior margin of eye runs backwards to beneath base of third dorsal spine; it has a depression above middle of eye and another above posterior part of eye. Superior margin of eye with a ridge which is scarcely continuous with that of anterior margin. From behind eye, about on a level with superior margin of pupil, a broken horizontal ridge extends backwards above gill-opening nearly to tip of opercular flap. Suborbital stay with a sharp, smooth ridge extending back and joining at right angles a ridge that follows around margin of preopercle. From the latter and below its junction with suborbital ridge the preopercle sends a ridge backwards which ends in a sharp spine. Preorbital with a short spine anteriorly projecting transversely to maxillary; a long sharp spine follows upper contour of maxillary and is as long as half the diameter of eye. Gill-rakers short, blunt, uneven; about 4+8 in number.

Entire head, a space on back below dorsal, breast, and a space behind base of pectoral, naked. Sides of body covered with small granulations which are somewhat thickened towards their posterior margins but are not spiniferous.

Dorsal without a notch between the spinous and rayed portions. The first spine not longer than eye (its tip broken), its base above middle of eye. The second spine over twice as long as the first; the fifth equal to distance from eye to tip of opercular flap. The middle rays of soft dorsal longest; their length equal to the distance from tip of snout to preopercular ridge; the posterior margin of the fin straight, forming an angle slightly less than a right angle with the superior margin. The last ray is adnate to the caudal peduncle for its whole length, the membrane not quite reaching to base of caudal.

The anal spines are graduated; the first scarcely as long as diameter of eye, the third twice the length of the first. When the fin is depressed the tips of the middle rays reach the base of the caudal. The last ray is adnate to the caudal peduncle for about half its length. When ventral fins are depressed the longest ray reaches to the base of the first anal spine, while the tip of the ventral spine falls short of it a distance equal to the diameter of the eye. Pectoral angulated, the sixth and seventh rays longest, reaching to above the first anal ray. Caudal fin narrow and elongate, with the posterior margin rounded; its length $1\frac{1}{4}$ in head.

Color (from a specimen long in spirits) slaty white with brownish markings. Membrane of spinous dorsal clouded with brownish; some of the spines with a small, dark spot in front of them. All of the other fins with vermiculated markings transversely across the rays. A large dark brown spot behind upper part of gill-opening and a smaller one on lateral line below base of last dorsal spines. Eye with traces of lines radiating from the center.

The type is a single specimen (No. 6433 on the Stanford Museum Register) in good condition, 217 mm. long, presented to Stanford University by Professor Mitsukuri of the Imperial University of Tokyo. It is said to be from Kagoshima in Kiusiu, and to bear the local name of Yama-no-kami, or Mountain Goddess, in local mythology a woman with wings, capable of starting a storm.

Dimensions.

	mm.	Hundredths of length without caudal.
Entire length.....	217	
Length without caudal.....	163	
Head.....		.40
Depth.....		.37
Eye.....		.10
Maxillary.....		.16
Snout.....		.10
Depth of caudal peduncle.....		.08
Length of pectoral.....		.37
Length of fifth dorsal spine.....		.20
Length of longest dorsal rays.....		.22
Length of longest anal rays.....		.24
Length of ventrals.....		.27
Distance from base of last anal ray to base of caudal.....		.20

Pomacentrus cœlestis, sp. nov.

PLATE XXI.

Head 3.5 in body; depth 2.8; eye 3.1 in head; maxillary 3.2; interorbital 4, equal to snout. Dorsal XIII, 14; anal II, 14; scales $2\frac{1}{2}$ —25—9.

Body regularly ovate-oblong, the anterior dorsal profile more convex than ventral. Interorbital space convex. Tip of snout on a level with lower margin of eye. Mouth small, slightly oblique, the jaws about equal; maxillary reaching to below anterior edge of pupil; teeth in a single row in jaws, conical, rather blunt. Preorbital entire. Preopercle sharply denticulated.

Dorsal without a notch between the spinous and rayed portions. The rays and spines are evenly graduated from the first spine to the eighth or ninth soft ray. The last spine is about twice the length of the first, while the ninth ray is about three times. The rays thence rapidly shorten, leaving the longest rays projecting beyond the tip of the last ray a distance nearly equal to the latter's length, and reaching past base of caudal rays. Anal similar to dorsal and about of the same height; its base and tips of longest rays ending slightly anterior to those of dorsal. Pectoral shorter than head by about half the eye's diameter; its tip reaching to within a scale and a half above origin of anal. The first ray of ventral filamentous; its tip just reaching to anal. Lobes of caudal pointed, the upper lobe the longer.

Snout, lower jaw, interorbital ring, and edge of preopercle naked. Cheeks with two rows of scales. Scales on top of head extending forward to above anterior edge of pupil. A row of scales between each ray and spine of anal, dorsal, and caudal. Lateral line on sixteen scales, stopping under base of last dorsal spine.

Color in alcohol: back above lower edge of pectoral cobalt blue with a vertical dark line at the base of each scale, which extending under the transparent edge of each preceding scale shows through it, the color below

fading into a purplish brown with a faint blue spot on each scale; dorsal and anal blackish, darker anteriorly; ventrals light, the outer edges dusky; pectorals and caudal yellowish, a black band across base of pectoral rays; edges of caudal and tips of rays dusky.

Dimensions.

Length without caudal in millimeters.....	58
Head in hundredths of length.....	27
Depth	35
Eye.....	9
Distance from snout to dorsal.....	34
Depth of caudal peduncle	13
Length of pectoral	26
Length of ventral	25
Length of caudal.....	33
Greatest height of dorsal	21
Greatest height of anal.....	21
Number of dorsal rays	XIII, 14
Number of anal rays.....	II, 14
Scales.....	2½—25—9

This strongly marked species is described from a single specimen collected by Jordan and Snyder at Wakanoura, in Kii, Japan. It is numbered 6434 in the collection of Stanford University. It differs from almost all other species of *Pomacentrus* in the elongation of the body.

Heptranchias deani, sp. nov.

The shark occasionally taken on the coast of Japan, and hitherto recorded as *Notidanus indicus*, or better *Heptranchias indicus*, is distinct from the latter species which belongs to the East Indies and is not known either from Japan or from California.

Head narrow, as broad as deep; snout rather short, sharply pointed in profile, narrowly rounded when viewed from above, its length from mouth contained once and a half in cleft of mouth. Nostrils a little nearer mouth than tip of snout. Mouth rather pointed or very narrowly rounded in front, the width across lower jaw at base of cleft of mouth slightly less than length of cleft of mouth. Upper teeth without lateral cusps, sharp and slender, and hooked backwards at an angle from their base. Four teeth on each side of lower jaw and a single tooth at tip of jaw, the cusps of each tooth on a level forming a serrated cutting edge; the median tooth with a median enlarged cusp and two or three small cusps on each side of it; the lateral

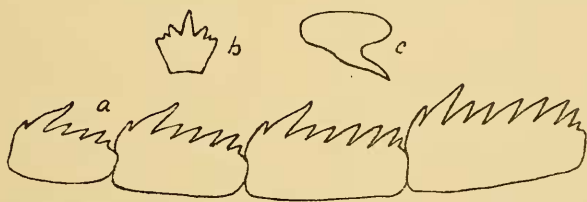
teeth with the first and last cusps very small, the second large and the succeeding ones except the last subequal and half the size of the second. The following is the formula of cusps, the addition marks separating sizes: $1+1+3+1$; $1+1+4+1$; $1+1+5+1$; $1+1+6+1$. Eye very large, the width across iris nearly half the length of snout.

Dorsal with the anterior oblique edge a little longer than its base—the fin inserted before anal a distance equal to the anterior margin of the anal. Height of anal scarcely more than half that of dorsal; its base equal to base of dorsal. Ventrals long and low, but a little higher than anal, their anterior oblique edges contained twice and a fourth in their base. The anterior edge of pectoral is contained about once and a half in head. Lower lobe of caudal is contained four and one-fourth times in upper lobe.

The color in life is plain brown, paler below. In a photograph in the Imperial University a few whitish spots are shown.

Comparing an adult female specimen of *Heptranchias deani* from Misaki with the excellent figure of *Heptranchias indicus* given by Macdonald and Barron of a specimen from Bass Straits, the following differences are apparent.

The snout in the Japanese species is longer and more pointed. The gill-openings rise much higher, their upper edge on the level of the spiracle. The more marked difference lies in the teeth. As figured by Macdonald and Barron, the teeth are different in the two sexes, the central tooth above only being alike in the two. In the male of *Heptranchias indicus* the denticles diverge from an axial line, or principal fang, in each lower tooth, the upper teeth having two denticles at base of the central point. In the female the principal fang and all the denticles in the lower teeth diverge from the central line of the whole jaw.



Heptranchias deani, sp. nov.—a, lower teeth; b, lower median tooth; c, upper tooth.

In the upper teeth there is but one denticle, at the base of the larger one; these teeth are nearly erect. In other words, the upper teeth in the male have the denticles

arranged above, 1+1+1, the median largest; the lower, 3+6, the third and fourth largest. In the female, the upper teeth are 1+1, the second denticle largest, the lower, about six, all turned the same way, the second rather largest, the others on a slanting base and progressively decreasing.

In *Heptranchias deani*, the lower teeth in the female have the cusps placed nearly on a level, subequal in size, except the second, which is much higher than any of the others. The upper teeth are much more oblique than in *Heptranchias indicus*.

This species is known to us from an adult female (No. 12620, Stanford University Museum) taken at Misaki by Kumakichi Aoki with hook and line in deep water. It was studied at the time by Dr. Bashford Dean and the senior writer. We take great pleasure in naming the species for that accomplished student of Selachology.

STANFORD UNIVERSITY,
March 10, 1901.